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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,881	07/18/2003	Sunil G. Warriar	02-510	2745

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NEW HAVEN, CT 06510

EXAMINER

HODGE, ROBERT W

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/622,881

Applicant(s)

WARRIER ET AL.

Examiner

Robert Hodge

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-12 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) 13-21 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 7, 9-12 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/4/06 have been fully considered but they are not persuasive. Applicants state that the Cubukcu reference does not disclose a bipolar plate that is located between opposing fuel cells and state that Cubukcu only teaches a bipolar foil that is welded to a photolithographic member. The whole purpose of the combined structure as disclosed by Cubukcu is to provide a rigid structure to the bipolar foil and it is clear that the combined structure is situated between two opposing fuel cells especially since the purpose of Cubukcu is to great a fuel cell stack. If the bipolar foil was not present then the stack would be made a lot thicker because twice as many parts would have to be used to replace the bipolar foil in Cubukcu. Applicants have also chosen to use open claim language, therefore more structure can be present in the prior art and still read on the claims as recited and as long as the prior art is capable of performing the same function of the instant invention it will still read on the claims as recited. Applicants' further state that the Gottzmann reference does not disclose a solid oxide fuel cell stack. Applicants are only reciting that the structural components recited in the claims are "for a solid oxide fuel cell" which is its intended use. Therefore the structure in the prior art only has to be capable of being used in a solid oxide fuel cell stack. Gottzmann teaches a solid oxide tube and shell reactor which operates at the same temperatures as solid oxide fuel cells and requires the same type of sealing as solid oxide fuel cells in order to operate efficiently. Therefore the structure that the Examiner is relying on is capable of being used in a solid oxide fuel cell and therefore

Art Unit: 1745

reads on the claims as recited. Applicants further state that Gottzmann does not teach "a continuous fiber tow wrapped into a closed-loop structure forming a substantially gas impermeable seal". As seen in column 9, starting at line 39, Gottzmann discloses "an O-ring seal 50, or alternatively one or more wraps or rings of a braided or twisted rope seal", which reads on applicants recited claim language. Applicants further state the other structural features that are recited in the claims, where the Examiner has used the Gottzmann reference to show obviousness cannot be combined with Cubukcu because Gottzmann does not teach a fuel cell. As stated above the two references are analogous because of their similar chemistry and operating temperatures as well as the need for sealing the structure.

In response to applicant's argument that Gottzmann is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Gottzmann teaches a solid oxide tube and shell reactor which operates at the same temperatures as solid oxide fuel cells and requires the same type of sealing as solid oxide fuel cells in order to operate efficiently.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the

Art Unit: 1745

references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Gottzmann with Cubukcu is to utilize techniques in a solid oxide tube and shell reactor that operates at the same high temperatures with similar chemistry in order to properly seal the fuel cell stack of Cubukcu.

The Examiner acknowledges that the amendments to the claims are a matter of form.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 9-12 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,074,771 hereinafter Cubukcu in view of U.S. Patent No. 6,139,810 hereinafter Gottzmann.

Cubukcu teaches a solid oxide fuel cell comprising at least two fuel cells each comprising an electrolyte having anode and cathode layers on respective sides and at least one bipolar plate between the at least two fuel cells. Cubukcu also teaches the necessity of sealing the fuel cells properly to prevent gas leakages (abstract, column 4, line 61 – column 7, line 44 and column 13, line 6 et seq.).

Cubukcu does not teach all of the specifics of the seal used for sealing between the plates.

Gottzmann teaches a solid oxide fuel cell stack with at least two fuel cell components being a separator and a fuel cell, that are sealed with a continuous fiber tow wrapped into a closed loop structure (i.e. twisted rope seal) forming a substantially gas impermeable seal between the two components, wherein at least two fibers are in a substantially concentric relationship with each other, also comprising a compression stop extending from one of the fuel cell components to another fuel cell component that is frame like in shape as well as a groove to hold the seal member, with dimensions similar to those found in claim 12 and that said seal can be compressed (figures 1-4, and column 7, line 8 – column 10, line 35).

At the time of the invention it would have been obvious to a person having ordinary skill in the art to include the teaching of the sealing mechanism used in the Gottzmann reference in the Cubukcu reference in order to properly seal the fuel cell stack and prevent any of the reactant gases from leaking out of the stack thus preventing any explosion hazards.

Claims 2, 3, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cubukcu in view of Gottzmann as applied to claims 1, 9-12 and 24-26 above, and further in view of U.S. Patent No. 4,640,875 hereinafter Makiel.

Cubukcu as modified by Gottzmann does not explicitly teach the material composition of the seal.

Makiel teaches a seal for a solid oxide fuel cell situated substantially perpendicular between a separator and a fuel cell component, wherein the seal comprises an oxide ceramic, or an alumina fiber that are substantially continuous and

Art Unit: 1745

concentric, wherein the fibers can be impregnated with Ni, Cr, and Fe. Makiel also teaches the use of a compression stop (or lip) and a groove (or lands) for said seal member as well as a frame used in the system near the seal (figures 1-5, column 1, line 54 – column 8, line 2 and claim 1).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to include the teachings of the Makiel reference in Cubukcu as modified by Gottzmann in order to provide a seal that is composed of well known materials that are resilient and durable and would not have to be replaced very often, which would require shutting down the fuel cell system.

Allowable Subject Matter

Claim 5 is allowed.

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The reasons for indicating allowable subject matter can be found in the final office action dated 10/19/05.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Hodge whose telephone number is (571) 272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RWH



PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER